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# Virtual Competence: A New Perspective on Individual Knowledge, Skills and Abilities in Virtual Organizations

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## ABSTRACT

Organizing and accomplishing virtual work presents both opportunities and challenges. Our review of the literature indicates that an important element of the virtual organization phenomenon - individual knowledge, skills and abilities (KSAs) to work virtually (Powell, Picoli and Ives, 2004), has not been well studied. Based on Bandura's (1986) social cognitive theory, we theorize that a better understanding of individuals' KSAs is a potential avenue for managing the complexity of distributed contexts. In this study, we empirically develop the construct of individual virtual competence within a nomological network to shed light on how individuals develop capacities in daily activities to help them perform in virtual settings. Our current theorization suggests that virtual competence is a critical capability of an individual to work effectively in virtual organizations. We are currently collecting data. Therefore, this research-in-progress presents theory development and hypotheses, along with an outline of our data collection activities. Results of our empirical analysis and our conclusions will be presented at the conference.

## Keywords

Virtual organization, computer mediated communication, virtual competence, self-efficacy.

## INTRODUCTION

Virtual work has gained popularity - benefits result from its capacity to mobilize remote resources and create flexible work arrangements (Townsend et al., 1998). Nevertheless, research has identified various challenges that virtual settings engender (Mark, 2001). For instance, the influence of trust and the difficulty to build it in virtual settings have caught much attention (Jarvenpaa and Leidner, 1999). In response researchers have proposed various approaches (Powell, Piccoli and Ives, 2004). Some of them look at the internal network structure of virtual organizations (e.g., Ahuja, Galletta and Carley, 2003); some investigate the interactions among people within virtual organizations (e.g., Paul and McDaniel Jr, 2004). However, almost all studies are at the organizational or team level according to recent work (see Powell et al., 2004). Little research has been done on the variables at the individual level. Yet, individuals in fact play an important role in generating the overall performance of organizations (Marcolin et al., 2000). To fill this void in research, we focus on individuals in this study to enhance our understanding of virtual organizations. In particular, we examine individuals' knowledge, skill and abilities (KSAs) required to perform work in virtual settings (Powell et al., 2004).

We theorize that virtual competence (VC) is a key capability that individuals need to work effectively in virtual organizations. We argue that individuals who have higher VC perform better than others on virtual work. We develop measures for this construct and outline how we intend to test them in a nomological network based on integrating Social Cognitive Theory (Bandura, 1986) with relevant literature on virtual activities. Our contributions are twofold. First, we shift the research focus of virtual organizations to individuals and propose VC as a key construct to examine individual performance in virtual organizations. Secondly, we empirically develop its measures and thus provide a useful instrument for further investigations.

## A KEY CAPACITY IN VIRTUAL ORGANIZATIONS: VIRTUAL COMPETENCE

Virtual organization is a relatively new phenomenon that emerged during the 1990s along with the development of information and communication technologies (ICT's) (Townsend et al., 1998). However, this newness impedes its reaching full potential as expected because people are still in the process of learning how to use information technology to communicate and work remotely (Kock, 2004). Few studies have examined how people cope with this new work setting and

what capabilities facilitate this. Therefore, to understand this phenomenon, we propose VC as the major capacity that people develop to cope with virtual settings.

Competence has been widely adopted in various areas of information systems research (Bassellier, Benbasat and Reich, 2003; Marcolin et al., 2000). Marcolin and colleagues conceptualize user competence as users' capability to fully use ICT's (Marcolin et al., 2000); Bassellier and colleagues use IT competence to describe line managers' capacity to understand and apply ICT's (Bassellier et al., 2003). The consensus is that individuals who possess more of a certain type of competence will perform better on related tasks than other less competent individuals (Kraiger, Ford and Salas, 1993). However, competence has not been an object of study in virtual organizations. Seeing the important role of competence in human activities, we therefore conceptualize individual VC as the individual's potential to make full use of virtual environments to communicate so that they maximize their performance. Consistent with the role of competence in other contexts, VC reflects KSA's such that people who have higher VC should perform activities better than individuals who have lower VC in distributed contexts.

Previous research on competence have revealed it as a multi-dimensional construct (Marcolin et al., 2000). Concepts such as context specific knowledge, skill and self-efficacy are mentioned by most studies in the IS literature (Bassellier et al., 2003; Marcolin et al., 2000). Consistent with this finding, we theorize that VC is formed by three dimensions: virtual self-efficacy, media skill and social skill (see Figure 1).

Two types of self-efficacy are relevant to virtual settings (Staples, Hulland and Higgins, 1999). The first is computer self-efficacy (CSE) (Compeau and Higgins, 1995). Since virtual organizations heavily rely on ICT's (Townsend et al., 1998), individuals' confidence in using them can directly influence their effectiveness. The second is remote work self-efficacy (RWSE) which reflects an individual's confidence in undertaking the collaborative work and tasks (Staples et al., 1999). People have to believe they are capable of working remotely. Therefore, combining these two components, we define *virtual self-efficacy* as one's belief about his/her ability to accomplish behaviors and tasks in virtual settings using ICT's.

The second dimension of VC is media skill. Virtual organizations are built on ICT's (Townsend et al., 1998). However, ICT's have been perceived as relatively lean (Daft and Lengel, 1986). How to utilize this type of media to communicate effectively appears a challenge to many individuals (Kock, 2004). Therefore, it constitutes an important aspect of individuals' capacities in virtual organizations. Here, we define *media skill* as an individual's skill (as opposed to a perceived level of confidence) at using features of information communication technologies to their full potential in order to facilitate communication.

The third dimension of VC is virtual social skill. The interaction among members has been a fruitful focus of research on virtual organizations. Activities, such as building interpersonal relationship and setting up common norms, have been found helpful to improve the performance of virtual organizations (Powell et al., 2004). To conduct those activities, it requires individuals to have capacities to interact with people, such as building trust, without meeting each other in person (Paul and McDaniel Jr, 2004). Therefore, we define virtual social skills as an individual's knowledge about, and skill at, building social relationships with others in virtual settings.

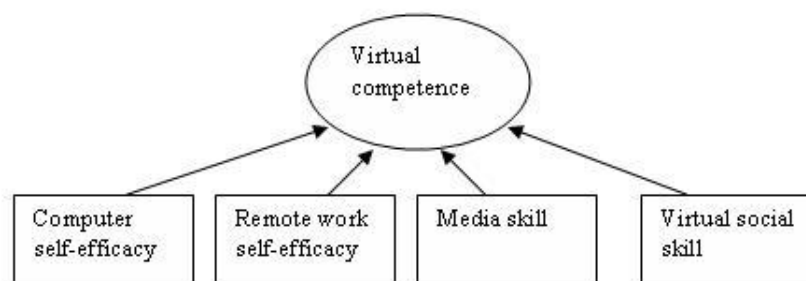


Figure 1. Virtual Competence as A Multi-dimensional Construct

### A NOMOLOGICAL NETWORK TO TEST VIRTUAL COMPETENCE

According to (Cronbach and Meehl, 1955), the development of measures of a construct has to be situated in a nomological network. Therefore, we adopt a model based on Bandura' (1986) social cognitive theory (SCT). SCT emphasizes the

reciprocal interaction of behaviours, environmental factors, and individual cognitive and other personal factors. The general argument of our model is that experiencing virtual activities help people to build competence to deal with virtual settings, which in turn influences their performance in virtual organizations (shown in Figure 2).

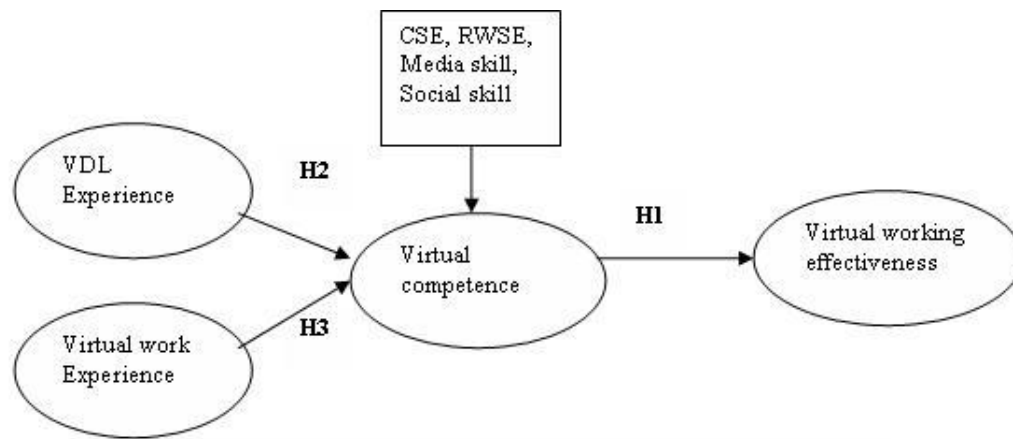


Figure 2. A Model of Virtual Competence in Virtual Organizations

The dependent variable in our model is virtual working effectiveness. Competence has been found an important antecedent of individuals' effectiveness in various settings (Payne, 2005; Shi, Kunnathur and Ragu-Nathan, 2005). Thus, we hypothesize that:

**H1:** *Virtual competence is positively related to virtual working effectiveness.*

As suggested by Bandura (1986), individuals develop cognitive and other personal traits through behaviors. In the same vein, VC is developed when individuals conduct virtual activities. Since individuals are exposed to virtual activities in both work life and daily life, they are likely to develop VC in both settings (Wang and Haggerty, 2005). Therefore, we hypothesize:

**H2:** *Individuals who engage in more virtual activities in daily life (VDL) will develop greater virtual competence.*

**H3:** *Individuals who engage in more virtual activities at work will develop greater virtual competence.*

Additionally age, gender, education, job title and IT competence will be controlled when testing hypotheses.

## METHODOLOGY

We employ a self-report, electronic survey. We have two stages of the data collection, the pilot and the final data collection. The pilot will enable us to refine our instruments. We are currently at the pilot stage and are using MBA students at a North American business school to collect data. The final data collection will be conducted with working alumni of a North American business school. The sample will be selected randomly across all alumni on the basis of 3 criteria: knowledge work jobs, not executives, with a mix of work experience. Dillman's (2000) advice for survey methodology will be followed to maximize response rates

The measures of constructs are all adapted from extant studies. Consistent with our definition of VC as a multi-dimensional construct, we will analyze it as formed by its 4 sub-constructs (Law, Wong and Mobley, 1998). Measures of computer self-efficacy are adopted from Compeau and Higgins's (1995) items; measures of remote work self-efficacy are a short version adapted from Staples and colleagues' items (1999); measures of media skill are adapted from Webster and Trevino's items (1995); measures of virtual social skill are adapted from Ferris and colleagues' (2001). Experience with virtual activities will be measured by the frequencies of these activities.

To test the measures of VC and hypotheses, partial least squares (PLS) analysis is used in this study.

## SUMMARY

Competence is a widely accepted concept in the IS literature. However, it has not been applied to the research on virtual organizations. In this study, we propose VC as a competence situated in the context of virtual organizations that determines

individuals' performance. By testing it in a nomological network, we provide a new instrument for researchers to understand virtual organizations from the KSAs perspective. As a research-in-progress, this study is still at the stage of data collection. Measures and hypotheses will be tested once the data collection is finished and the results will be presented at the conference.

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